

Claims

[c1] What is claimed is:

1.A dual-display flat display device having a first side and a second side opposite to first side comprising:
a first light module for generating light beams; and
a display panel having a transflective structure therein,
wherein portions of the light beams are reflected by the transflective structure for displaying a first image on the first side of the dual-display flat display device, and portions of the light beams pass through the transflective structure for displaying a second image on the second side of the dual-display flat display device.

[c2] 2.The dual-display flat display device of claim 1 further comprising a second light module for generating light beams to pass through the transflective structure for displaying the first image on the first side of the dual-display flat display device.

[c3] 3.The dual-display flat display device of claim 1 wherein the display panel comprises a first substrate, a second substrate positioned between the first substrate and the first light module, and a liquid crystal layer positioned between the first substrate and the second substrate.

- [c4] 4.The dual-display flat display device of claim 3 wherein the first substrate is positioned between the transflective structure and the liquid crystal layer.
- [c5] 5.The dual-display flat display device of claim 3 wherein the transflective structure is positioned between the first substrate and the liquid crystal layer and comprises a plurality of transflective regions.
- [c6] 6.The dual-display flat display device of claim 5 wherein the transflective structure comprises a plurality of reflective regions and a plurality of transmissive regions.
- [c7] 7.The dual-display flat display device of claim 6 wherein each of the reflective regions is a reflector comprising a planar surface or an uneven surface.
- [c8] 8.The dual-display flat display device of claim 7 wherein the second substrate is a color filter.
- [c9] 9.The dual-display flat display device of claim 8 wherein the color filter is a light-condensing color filter.
- [c10] 10.The dual-display flat display device of claim 9 wherein the color filter is a dual color filter having a plurality of first regions respectively corresponding to the reflective regions of the transflective structure, and a plurality of second regions respectively corresponding to

the transmissive regions of the transflective structure.

- [c11] 11.The dual-display flat display device of claim 10 wherein a thickness of each first region is smaller than a thickness of each second region.
- [c12] 12.The dual-display flat display device of claim 10 wherein a thickness of each first region is the same as a thickness of each second region.
- [c13] 13.The dual-display flat display device of claim 10 wherein each of the first regions comprises at least a pervious to light region.
- [c14] 14.The dual-display flat display device of claim 10 wherein each of the second regions comprises at least a pervious to light region.
- [c15] 15.The dual-display flat display device of claim 8 further comprising a light-condensing structure positioned on the second substrate for condensing portions of the light beams generated by the first light module to the transmissive regions of transflective structure.
- [c16] 16.The dual-display flat display device of claim 15 wherein the light-condensing structure comprises a plurality of micro lenses.
- [c17] 17.The dual-display flat display device of claim 1

wherein the first light module comprises a light source for generating light beams, a light-guiding plate for guiding the light beams generated by the light source, and a switching element for controlling brightness of the light source.

[c18] 18.The dual-display flat display device of claim 1 wherein the first image and the second image are asynchronously displayed on the first side and the second side.

[c19] 19.The dual-display flat display device of claim 18 wherein the first image is a mirror image of the second image.

[c20] 20.The dual-display flat display device of claim 18 wherein the first image and the second image are scaled-down images.

[c21] 21.The dual-display flat display device of claim 18 wherein the first image is different from the second image.

[c22] 22.The dual-display flat display device of claim 18 further comprising a memory for storing image data that are read out to display the first image and the second image.

- [c23] 23.The dual-display flat display device of claim 22 wherein the image data are read out to display the first image and the second image by determining a starting point.
- [c24] 24.The dual-display flat display device of claim 22 wherein the image data are read out to display the first image and the second image by dividing the image data and determining a starting position of the divided image data.
- [c25] 25.The dual-display flat display device of claim 1 wherein the display panel comprises a liquid crystal display panel, an electrophoresis display panel, or an active matrix light-emitting diode display panel.